Peribiliary cysts mimicking biliary ductal dilatation on ultrasound, correctly diagnosed on magnetic resonance imaging.

A 78 year old male with cirrhosis presents for ultrasound for screening for hepatocellular carcinoma.

Imaging Findings:

A 78 year old male with cirrhosis and portal venous hypertension complicated in the past with ascites, esophageal varices and hepatic encephalopathy presented for ultrasound screening for hepatocellular carcinoma. The patient’s most recent endoscopic exam revealed resolution of esophageal varices and the patient has been symptom free. He had an elevated total bilirubin (3.32 mg/dl) but the remainder of his LFTs were unremarkable. An ultrasound (US) exam was interpreted as central intrahepatic biliary ductal dilatation(Fig. 1, 2). Subsequently, Magnetic Resonance imaging (MRI) of the liver with Magnetic Resonance cholangiopancreatography (MRCP) was performed which revealed peribiliary cysts but no evidence of biliary ductal dilatation (Fig. 3, 4, 5, 6).

Discussion:

In 1984, Nakanuma et al. published an autopsy series that showed multiple peribiliary cysts at the hepatic hilum and around the larger portal tracts [1]. Subsequently, the same author published a systematic study of 1000 autopsies that found peribiliary cysts in 20% of autopsied livers [2]. The cysts were adjacent to but did not communicate with the biliary tree and were lined with columnar or cuboidal epithelium; consistent with dilatation of the periductal glands. Most of the patients with peribiliary cysts had chronic liver disease and severe portal vein hypertension. Subsequent autopsy and imaging studies showed that peribiliary cysts were rare in normal livers and if present mild [3, 4]. Peribiliary cysts are also associated with polycystic liver disease and occur at an increased rate in liver transplants [5-7].

There are multiple etiologies of peribiliary cysts; those arising in the setting of chronic liver disease are likely associated with intrahepatic circulatory disturbances of the portal venous system, while those found in the setting of polycystic liver disease may have a similar pathogenesis as the intraparenchymal cysts of polycystic liver disease and autosomal dominant polycystic kidney disease [8, 9]. Long term follow up has shown that the cysts increase in size and number over time [10-13].

Since their discovery, advances in imaging have increased the detection of peribiliary cysts [14]. The importance of properly diagnosing this entity is two fold: First, there are documented reports of complications of peribiliary cysts, including at least 8 cases of obstructive jaundice [5, 15-21]. Second, misdiagnosis due to unfamiliarity with the entity and its appearance has lead to unnecessary workup and surgery.

Misdiagnosis as biliary dilatation, particularly on US, as in the case reported here and computed tomography (CT) has been previously reported [12, 13]. There are three reported cases of patients going to surgery after US, CT and MRI findings raising concern for biliary dilatation due to cholangiocarcinoma or Caroli’s disease [22-24].

US typically shows anechoic cystic structures adjacent to the intrahepatic large bile ducts and large portal vein.
branches near the hilum, but can show tubular anechoic lesions around the large portal tracts mimicking bile duct dilatation [13, 17, 25]. CT findings include discrete cysts, tubular hypodensities paralleling the portal structures, or a string of cysts that simulate abnormal bile ducts [17]. On MRI, peribiliary cysts appear as clustered or tubular structures of fluid signal intensity (low on T1 weighted images and high on T2 weighted images including MRCP sequences) with peripheral and septal enhancement and lack of soft tissue mass like enhancement. MRI findings have also been reported to simulate a dilated bile duct [17].

This case illustrates the importance of considering peribiliary cysts when interpreting cystic structures/spaces adjacent to the portal tracts, especially in patients with liver disease. Excluding connection with the biliary system is key. MRI/MRCP play an important role in differentiating the cysts from the adjacent non-dilated intra and extra-hepatic biliary tree and demonstrating lack of mass like enhancement (Fig. 3-6).

**Differential Diagnosis List:** Peribiliary cysts

**References:**


Description: Sagittal view of the liver show multiple small hypoechoic and enechoic structures in the central perihilar region of the liver (white arrows) that were mistaken for central intrahepatic biliary ductal dilatation. Incidentally found gallbladder stones are shown (curved white arrow). Origin:
Figure 2

Description: axial view of the liver show multiple small hypoechoic and enechoic structures in the central perihilar region of the liver (white arrows) that were mistaken for central intrahepatic biliary ductal dilatation. Incidentally found gallbladder stones are shown (curved white arrow). Origin:
Description: Axial T2 weighted (TR/TE:683/91) Single Shot Fast Spin Echo (1.5 T GE MR scanner) images of the liver shows multiple tubular and rounded cystic fluid signal intensity structures around the central biliary ducts (white arrows). The common bile duct is not dilated (black arrow in 4). Irregularity of the hepatic surface is consistent with the known diagnosis of hepatic cirrhosis (curved white arrows). Origin:
Figure 4

Description: coronal T2 weighted (TR/TE:683/91) Single Shot Fast Spin Echo (1.5 T GE MR scanner) images of the liver shows multiple tubular and rounded cystic fluid signal intensity structures around the central biliary ducts (white arrows). The common bile duct is not dilated (black arrow in 4). Irregularity of the hepatic surface is consistent with the known diagnosis of hepatic cirrhosis (curved white arrows). Origin:
Description: Maximum intensity projection (MIP) image from a 3-dimensional thin-slab MRCP sequence (TR/TE:4285/1181) showing multiple small tubular and rounded cysts around the intrahepatic central biliary radicles (white arrows). The common bile duct (curved white arrow) and the intrahepatic ducts (arrowheads) are not dilated. Origin:
**Description:** Axial subtraction image through the liver (obtained by subtraction of non-enhanced 3-dimensional spoiled gradient echo fat saturated sequence (TR/TE/flip angle: 4.18/1.99/7) from a contrast enhanced sequence with similar parameters) reveals only thin linear wall and septal enhancement of the peribiliary cysts (white arrows) with no mass like soft tissue enhancement. **Origin:**